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*Published in:*
Ethnicity & Health

*DOI:*
10.1080/13557850903373908

Ethnicity & Health

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/ceth20

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Version of record first published: 12 Feb 2010

To cite this article: Frank van Tubergen & Anne-Rigt Poortman (2010): Adolescent alcohol use in the Netherlands: the role of ethnicity, ethnic intermarriage, and ethnic school composition, Ethnicity & Health, 15:1, 1-13

To link to this article: http://dx.doi.org/10.1080/13557850903373908

*Ethnicity & Health*
Vol. 15, No. 1, February 2010, 1–13

Routledge
Taylor & Francis Group

# Adolescent alcohol use in the Netherlands: the role of ethnicity, ethnic intermarriage, and ethnic school composition

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*(Received 17 June 2008; final version received 10 September 2009)*



**Objective.** To examine the association between ethnicity, ethnic intermarriage, ethnic composition of schools and adolescent alcohol use.
**Design.** Data were derived from the National Survey of Students in the Netherlands, a repeated, nationally representative, cross-sectional study of students aged 11–20 in secondary school. Surveys conducted in 1994, 1996, 1999, and 2001 were pooled, leading to a total of 30,346 native Dutch students and 6227 ethnic minority students. Alcohol use was based on whether the student consumed alcohol at all, drinking frequency, and drunkenness. Multilevel methods were applied.
**Results.** Ethnic minority students showed lower levels of alcohol use than Dutch students in each measure. Among ethnic minorities, the level of alcohol use was particularly low among students from a Muslim background. Students with ethnically mixed parents had higher levels of alcohol use than students with mono-ethnic parents. The larger the presence of Muslims in school, the lower the alcohol consumption of students from a Dutch and ethnic minority background.
**Conclusions.** Ethnic differences in alcohol consumption among students seem to reflect differential alcohol use norms prevalent in their parents' country of birth. Alcohol use norms are presumably stricter in families with mono-ethnic parents and in predominantly Muslim schools than in families with ethnically mixed parents and in schools with fewer Muslim students.

**Keywords:** adolescents; alcohol use; ethnicity; immigrants; Muslim

## Introduction

Alcohol consumption is a serious health risk for adolescents in western countries. Recent figures show that alcohol use problems are particularly widespread in the European Union, which is the heaviest drinking region of the world (Anderson and Baumberg 2006). There have been many empirical studies describing patterns of alcohol use among adolescents, both in Europe and elsewhere, and there is an important body of literature explaining individual and contextual variations in adolescent alcohol consumption (e.g. Petraitis *et al.* 1995). These studies, however, have been conducted almost exclusively among samples of the general population. Less is known about the alcohol use of adolescents from ethnic minorities (Caetano 1987, Cochrane and Bal 1990, Caetano and Clark 1999, Elder *et al.* 2000, Gil *et al.* 2000, Galvan and Caetano 2003, Hahm *et al.* 2004, Rodhame *et al.* 2005, Zemore 2005), particularly in Europe.

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ISSN 1355-7858 print/ISSN 1465-3419 online

DOI: 10.1080/13557850903373908
http://www.informaworld.com

Unlike the high drinking levels reported in Europe, many ethnic minorities were born and raised in a 'dry' culture. This is particularly the case for ethnic minorities from a Muslim background. As proscribed by religious doctrines in the Koran, Muslims are prohibited from consuming alcohol, whereas such strong normative constraints do not apply to other religions (Dotinga 2005). Several studies have indeed found that immigrants, and particularly those from Muslim countries, consume alcohol less often than other groups (e.g. Cochrane and Bal 1990, Dotinga 2005). One important question is whether, as a consequence of parental socialization, the children of immigrants, and especially those from a Muslim background, likewise consume lower levels of alcohol.

In a study among 16–17-year-old students in Oslo (Norway), Pedersen and Kolstad (2000) observed that immigrant children from a Muslim background indeed had significantly higher levels of abstinence than native children or children from another ethnic background. This finding was replicated by Amundsen *et al.* (2005), who used a survey conducted in the same city (Oslo) among 15–16-year-old students, and by Bradby and Williams (2006), who examined 14–15 and 18–20-year-old Muslims and non-Muslims in Greater Glasgow (Scotland). The current study examined whether adolescents from an immigrant background, and especially a Muslim background, display lower levels of alcohol use in the Netherlands.

This study also examined the role of ethnic school composition. The literature on the influence of school cultures shows that the norms and practices of peers are important determinants of substance use (e.g. Urberg *et al.* 1997, Kumar *et al.* 2002, Ellickson *et al.* 2003, Wood *et al.* 2004, Bjarnason *et al.* 2005, Wallace *et al.* 2007), and that the average alcohol consumption in school affects the individual student's drinking behavior (Ennett *et al.* 1997, Kumar *et al.* 2002). Given the normative constraints on alcohol use for Muslim students, and the impact of peers on that use, it has been argued that the higher the proportion of Muslim students in school, the less alcohol is consumed (Amundsen *et al.* 2005). A negative association between the presence of Muslim students at school and alcohol use was indeed found in Norway, both for students from an immigrant background and for students from a Norwegian background (Amundsen *et al.* 2005). Evidence for this association was found more indirectly in a study by Monshouwer *et al.* (2007), who used data from a nationally representative cross-sectional survey among 12–16-year-old students in the Netherlands. They found that the proportion of ethnic minorities in school is negatively associated with the risk of episodic heavy drinking for ethnic minorities, but not for native-born Dutch students. Instead of contrasting the heterogeneous group of 'ethnic minority' students with native-born Dutch students (Monshouwer *et al.* 2007), the current study looked at the proportion of Muslim students in school, thereby examining whether the pattern found by Amundsen *et al*. (2005) could be replicated in the Dutch context.

Finally, the current study considered ethnic intermarriage in the Netherlands, a factor that has received little attention in the literature on adolescent alcohol use. Figures on the period between 1988 and 2002 showed that about 50% of Antillean immigrants, 20% of Surinamese immigrants, and about 5% of Turkish and Moroccan immigrants were married to a Dutch partner (Kalmijn and van Tubergen 2006). Individuals from ethnic minority groups who marry a native spouse are presumably a selective group that, before marriage, had more liberal norms on alcohol use than those who married with a co-ethnic spouse. In addition, partners may influence each

others' attitudes, and among intermarried couples, one partner is likely to support mainstream norms on alcohol use. For both reasons, children with one foreign-born and one native-born Dutch parent may be more exposed to the more liberal norms of Dutch society on alcohol use than children with mono-ethnic parents, but less so than children with two native-born Dutch parents. It was therefore expected that children of mixed parentage would drink more than children with mono-ethnic parents, and less than children with two native-born Dutch parents.

In summary, the aim of this study was to test the association between ethnicity, ethnic school composition, ethnic intermarriage, and alcohol use among adolescents in the Netherlands. In this study, 'ethnicity' was defined in terms of the country of birth of adolescents and that of their parents.



## Methods

### *Sample*

Data were derived from the National Survey of Students in the Netherlands, a large-scale survey ($n = 36{,}573$) that is nationally representative for secondary school students aged 11–20. The survey was designed and conducted by the Nationaal Instituut voor Budgetvoorlichting (NIBUD; National Institute for Budget Education). The survey was conducted for the first time in 1984 and repeated every two or three years. Because there was no information available on several variables in editions pre-dating 1994, and as more recent editions were not freely available, the current study pools surveys from 1994, 1996, 1999, and 2001. The sample includes a large group of students with two native-born Dutch parents ($n = 30{,}346$), two Muslim groups from Turkey (766) and Morocco (876), two groups from the former Dutch colonies of Suriname (944) and Antilles (268), and students from 'other' ethnic origins (3373).

All secondary schools in the Netherlands were asked to cooperate in the survey (NIBUD 1994–2001). A selection was made from among schools that responded positively in order to obtain a representative sample according to region, school's religious denomination, school type, and school year. The representativeness of the sample in terms of school level, school year, gender, and ethnicity strongly resembled that of other data sources involving students in the Netherlands (Zeijl and Kappelhof 2004). The analyses presented in this study covered a total of 337 schools.

Within the schools themselves, various classes were selected and students had two hours to fill in the questionnaire (self-completion). The survey responses were checked in detail by NIBUD for inconsistencies, excessive missing items, and deliberately providing wrong answers. Inconsistencies were corrected and respondents with many missing items or who clearly provided wrong answers were removed from the survey. Comparison of the NIBUD survey with other survey data showed very similar answer patterns (Zeijl and Kappelhof 2004).

### *Variables*

#### *Alcohol use*

Students were asked, 'How many glasses of alcohol (beer, wine, etc.) did you drink last month?' Possible responses were: (1) 'I don't drink alcohol'; (2) 'I didn't drink

any alcohol this past month'; or (3) 'I drank [...] glasses of alcohol in the past month.' In addition, students were asked how many times they had been drunk last month. Based on these two questions, we constructed three measures of alcohol use. First, we analyzed whether students had *ever consumed alcohol* (that is, those who did drink alcohol versus those who never drank alcohol). Among those who drank alcohol, we analyzed *drinking frequency* (that is, the number of glasses of alcohol consumed in the previous month) and *drunkenness* (that is, those who reported having been drunk at least once in the previous month versus those who reported not having been drunk in the previous month).

*Ethnicity*

The ethnic origin of students was allocated by asking about their parents' country of birth: 1% did not know. Students with two native-born Dutch parents were used as the reference category, and contrasted with those who had one or two parents born in (1) Suriname; (2) Dutch Antilles; (3) Turkey; (4) Morocco; or (5) in another country. Note that the 'other' ethnic group consisted of both Western (e.g. Germany, Belgium) and non-Western (e.g. China, Iran) origins. The restrictions imposed by the public use file prevented us from examining the alcohol use of these groups in more detail. To examine the role of ethnic intermarriage, we included a dummy variable contrasting students with one native-born Dutch and one foreign-born parent (score 1) with students with mono-ethnic parents (score 0). This means that (in multiple regression analyses, see Table 2) the impact of ethnic intermarriage was evaluated among the non-Dutch ethnic groups, whereas the role of parents' ethnic origin pertained to mono-ethnic couples.

*Percentage of Muslims in school*

The study used the percentage of first and second-generation Turkish and Moroccan students in school as a measure of the presence of Muslims in school, with figures being based on aggregated individual-level data on ethnicity in the survey. Although this could have been computed by means of self-identified religious affiliation, we did not choose this method for three reasons. First, 95% of the Turks and Moroccans who live in the Netherlands identify themselves as Muslim and many have traditional religious beliefs and frequently attend religious meetings (Van Tubergen 2007). Except for a small group of 'liberal' Muslims among the Surinamese (less than 8%), there are no Muslims in the other groups. Second, there was more missing information on self-identified religion (that is, 5%) than on parents' country of birth (1%). Third, focusing on self-identified religion is problematic in that it could be endogenous to the lifestyle (including alcohol use) of adolescents. This is not the case for the parents' country of birth.

*Control variables*

The present study takes several individual-level and school-level variables into account. To begin with, the study controls for age (in years) and gender, as these are well-known correlates to alcohol use. The year of the survey was included to account for unobserved survey or time-related variations in reporting on alcohol use. The

level of education of the student was also included: we measured the education in which the student was enrolled. In the Netherlands, the educational system is highly stratified, with different tracks at various levels of schooling (that is, ranging from lower secondary education to pre-university education). Ethnic minorities, particularly from a Turkish and Moroccan background, are less well educated than native-born Dutch students (Van de Werfhorst and van Tubergen 2007). The correlation between age and educational level is modest ($r = 0.29$).

It was also important to control for socio-economic position and personal problems, which are both related to ethnicity and alcohol use. Turkish and Moroccan students have a lower SES background, and having enough money to purchase alcohol is an important factor in its consumption. Variables were included measuring whether students received pocket money from their parents, and whether they had jobs. Two measures of personal problems were included. Statements such as 'I don't like to be at home,' and 'I don't get on well with my father,' and questions about problems with parents were used to construct a scale measuring how problematic the student's relationship was with his or her parents (range 0–1, Cronbach's alpha = 0.69). Personal problems in school were measured by statements such as 'I feel at home in school,' 'I would prefer to go to another school,' 'I get on well with most teachers' (range 0–1, Cronbach's alpha = 0.83). A proxy for a problematic school environment was included, as indicated by the percentage of the students in school who had skipped classes in the past month. Figures were obtained by aggregating individual-level data from the NSO survey on truancy.

The study also took into account that ethnic minorities, especially Turks and Moroccans, are more religious than native-born Dutch (van Tubergen 2007). Studies based on samples of the general population have found an inverse relationship between measures of religiosity (that is, religious attendance and perceived importance of religion) and substance use (e.g. Wallace *et al.* 2007). Although the survey does not have good measures of parental religiosity, the current study included a dummy variable indicating whether the father and/or the mother were a member of a religious denomination. Note that, because of the overlap between ethnicity and religious denomination, a measure of religious denomination was not included as a separate variable.

### *Cross-sectional design*

The study relied on cross-sectional data, making it impossible to reach definitive conclusions about the causality of relationships. The data also relied on self-reports of alcohol use instead of information on students' actual drinking patterns. Although self-reports are the least intrusive measurements available, they can be influenced by such factors as ethnicity. It is unknown whether ethnic differences in self-reports of alcohol use are related to social desirability. Self-reported data have, however, demonstrated reasonable levels of reliability and validity (Del Boca and Darkes 2003, Amundsen *et al.* 2005). Furthermore, it has been shown that administering the questionnaires in school classes while assuring anonymity, as was done in the present study, also improves the data quality (Smit *et al.* 2002, Monshouwer *et al.* 2007).

### *Analysis*

The first analysis examined alcohol use among secondary school students by ethnic group. Multilevel regression techniques were used to address the underestimation of standard errors because of the hierarchical nature of the data. More specifically, the multilevel techniques were used to perform the explanatory analyses, owing to the nesting of 36,573 students (level 1) within 337 schools (level 2) and the resulting interdependency of observations within schools (Snijders and Bosker 1999). Random intercept models were used. Frequency of drinking and drunkenness were analyzed among students who consume alcohol, since the effects of ethnicity, ethnic intermarriage, and school ethnic composition on drinking may differ from such effects on consumption patterns among drinkers (Amundsen *et al.* 2005). Multilevel logistic regression analysis was used to analyze whether the students had ever consumed alcohol and had been drunk. Multilevel linear regression was used to in the analysis of drinking frequency. The distribution is right-skewed, but additional analyses using the natural logarithm of drinking frequency (to reduce skewness) did not challenge the conclusions drawn in this study. The multilevel analyses were performed with MLwiN 2.02 (Rashbash *et al.* 2005).

## Results

Table 1 provides an overview of alcohol use per ethnic group among secondary school students in the Netherlands, covering the period between 1994 and 2001. Almost 80% of the students with two native-born Dutch parents consumed alcohol.

Table 1. Alcohol consumption among secondary school students in the Netherlands, by ethnic group (1994–2001).

| | | | Of those who drink alcohol | |
|---|---|---|---|---|
| Country of origin parents | *N* (total population) | Does drink alcohol (% yes) | Glasses consumed in previous month (mean) | Drunkenness previous month (% yes) |
| Antilles | 268 | 76 | 16 | 43 |
| Mono-ethnic | 119 | 72 | 12 | 31 |
| Mixed | 149 | 80 | 19 | 52 |
| Suriname | 944 | 66 | 11 | 37 |
| Mono-ethnic | 655 | 61 | 10 | 34 |
| Mixed | 289 | 78 | 14 | 41 |
| Turkey | 766 | 30 | 9 | 28 |
| Mono-ethnic | 725 | 28 | 9 | 28 |
| Mixed | 41 | 66 | 9 | 25 |
| Morocco | 876 | 16 | 15 | 41 |
| Mono-ethnic | 819 | 12 | 13 | 41 |
| Mixed | 57 | 60 | 20 | 39 |
| Other ethnic | 3373 | 70 | 16 | 45 |
| Mono-ethnic | 1171 | 56 | 13 | 39 |
| Mixed | 2202 | 78 | 17 | 48 |
| Both native born | 30,346 | 79 | 18 | 42 |

Among the group that consumed alcohol, the average number of glasses per month was 18, and 42% had been drunk at least once in the previous month. As expected, the Dutch students consumed alcohol most often, the Muslim groups (that is, Turks and Moroccans) the least often, and the other ethnic groups fell in between these groups. Among the Turkish students, only 30% had ever drunk alcohol at all, and this percentage was even lower among Moroccan students (15%). Among those who had consumed alcohol, however, the drinking frequency of Turks and especially Moroccans resembled that of other ethnic groups most closely. There was evidently a strong barrier to drinking alcohol at all among Moroccans and, to a lesser extent, Turks, but once that barrier was crossed, the alcohol consumption of Turks and, particularly, Moroccans resembled that of Caribbean and Dutch youth.

Table 1 distinguishes between mono-ethnic couples and couples in which one of the partners was of Dutch origin. Alcohol use was generally higher among the children of mixed couples than among those of mono-ethnic couples. For example, of the students with two Moroccan parents, 12% had consumed alcohol as opposed to 60% of the students with one Moroccan parent and one Dutch parent. Of those students who did consume alcohol, ethnic intermarriage was generally associated with higher frequency of drinking and drunkenness, except for Turks and Moroccans, where patterns were less clear.

The empty models of the two-level regression estimates indicated that 18% of the variation in 'does drink alcohol' occurred at the school level (results not presented).[1] Thus, there was a 0.18 correlation between the values 'does drink alcohol' of two randomly selected students in the same, randomly selected, school. Among the sub-sample of drinkers, 6% of the variation in drinking frequency and drunkenness was observed at the school level.

The results of the adjusted two-level regressions are shown in Table 2. Students with mono-ethnic parents consumed less alcohol than students with two native-born Dutch parents in each measure. As expected, there were important differences within the mono-ethnic population: Turks and Moroccans had much lower levels of alcohol use than Surinamese and Antilleans. These ethnic differences were especially pronounced when it came to drinking alcohol at all. Further analysis revealed approximately the same magnitude of ethnic difference for both males and females in each measure, although the analysis of 'does drink alcohol' showed that Turkish and Moroccan females differed more sharply from the other ethnic groups (results not presented).

Our findings on ethnic intermarriage were in line with expectations. Compared to students with mono-ethnic parents (that is, with two foreign-born parents), students with one foreign-born parent and one parent born in the Netherlands were more likely to drink alcohol (OR $=3.10$, $p<0.05$) and, if they did drink alcohol, they were more likely to have been drunk (OR $=1.46$, $p<0.05$) and consumed an average of 4.68 glasses more per month. Our findings for ethnic intermarriage apply for both males and females (results not presented).

The study found support for the hypothesized 'protective' role of Muslims in school. Table 2 showed that the percentage of the Muslim students (that is, Turks and Moroccans) in school was significantly associated with reduced alcohol use in each measure. We observed this finding for both males and females (results not presented). Including a quadratic specification to examine non-linearities was insignificant (results not presented). The results in Table 2 refer to the average effect

Table 2. Multilevel logistic regression of alcohol use and drunkenness in previous month, and multilevel linear regression of number of glasses of alcohol consumed in previous month, among secondary school students in the Netherlands, 1994–2001.

| | Total population | Of those who drink alcohol | |
|---|---|---|---|
| | Does drink alcohol (OR) | Drunkenness previous month (OR) | Glasses consumed in previous month (*b*) |
| School level | | | |
| Muslim (per 10%) | 0.80** | 0.91* | −1.34** |
| Skipped classes (per 10%) | 1.13** | 1.08** | 0.67* |
| Individual level | | | |
| Parental country of origin | | | |
| Native-born Dutch | 1 | 1 | 0 |
| Antilles | 0.51** | 0.87* | −3.58 |
| Suriname | 0.39** | 0.65** | −7.35** |
| Turkey | 0.08** | 0.38** | −12.10** |
| Morocco | 0.03** | 0.57** | −9.05** |
| Other ethnic group | 0.25** | 0.76** | −5.99** |
| Mixed ethnicity (0/1) | 3.10** | 1.46** | 4.68** |
| Problems with parents (0–1) | 3.55** | 3.22** | 10.32** |
| Problems at school (0–1) | 3.88** | 3.61** | 14.20** |
| Religiosity parents | | | |
| At least one not religious | 1 | 1 | 0 |
| Both parents religious | 0.85** | 0.85** | 0.10 |
| Missing | 0.87* | 0.93 | −0.27 |
| School level | | | |
| Lower | 1 | 1 | 0 |
| Intermediate | 1.19** | 0.87** | −1.73** |
| Higher | 1.09 | 0.72** | −3.94** |
| Age (11–20) | 1.50** | 1.36** | 4.26** |
| Male (0/1) | 1.08** | 1.38** | 10.18** |
| Has a job (0/1) | 1.42** | 1.43** | 4.52** |
| Pocket money parents (0/1) | 1.62** | 1.64** | 7.79** |
| Year survey | | | |
| 1994 | 1 | 1 | 0 |
| 1996 | 1.80** | 1.17* | 0.95 |
| 1999 | 1.80** | 1.48** | 3.70** |
| 2001 | 2.42** | 1.42** | 4.81** |
| *N* (school) | 337 | 337 | 337 |
| *N* (individual) | 36,573 | 27,603 | 27,603 |

*$p < 0.05$; **$p < 0.01$ (two-tailed test).

of the presence of Muslim students in school, for all groups together. Possibly, the effect differs by ethnic group. Table 3 presents the results of the effects of the percentage of Muslim students in school for each ethnic group separately. It appeared that the percentage of Muslims in school was significantly associated with reduced alcohol use in each measure for students with two native-born Dutch

Table 3. Multilevel regression effects of the presence of Muslims in school (per 10%), per ethnic group.

| | | Of those who drink alcohol | |
|---|---|---|---|
| Country of origin parents | Does drink alcohol (OR) | Drunkenness previous month (OR) | Glasses consumed per month (*b*) |
| Both native born | 0.84** | 0.93* | −1.42** |
| Foreign born | 0.77** | 0.91* | −1.50** |
| Suriname | 0.80** | 0.87* | −1.29 |
| Antilles | 0.89 | 0.66* | −4.53* |
| Turkey | 0.77** | 1.05 | −2.21 |
| Morocco | 0.79** | 1.38* | 0.89 |
| Other ethnic | 0.77** | 0.86* | −1.97** |

*$p < 0.05$; **$p < 0.01$; (one-tailed test).
Note: Controlled for mixed ethnicity, % skipped classes at school, problems with parents, problems at school, religiosity parents, school level, age, gender, whether student has a job, whether student receives pocket money, and year of survey.



parents. A significantly negative association was likewise observed for all ethnic groups (except Antilleans) with respect to drinking alcohol at all, and for Antilleans and 'other' ethnic groups with respect to drunkenness and drinking frequency. Of those students who drank alcohol at all, the percentage of Turks and Moroccans in school was not associated with drinking frequency among Turks and Moroccans or with drunkenness among Turks; it was significantly and positively associated with drunkenness among Moroccans.

## Discussion

This study elaborated on studies on ethnicity and alcohol use among students in Europe. The aim was to examine the association between ethnicity, ethnic intermarriage, ethnic school composition, and alcohol use in the Netherlands.

This study found huge ethnic differences in alcohol use in the Netherlands. The level of alcohol use of native-born Dutch students was extremely high, and only the Dutch Antillean students approached their drinking patterns. The Surinamese students had lower levels of alcohol use than the Antillean students, but by far the lowest level was observed among Turkish and Moroccan students, who are predominantly Muslim. In addition, the presence of Turks and Moroccans in school was significantly associated with lower levels of alcohol use among both ethnic minorities and native-born Dutch. Finally, it was found that students with two foreign-born parents consumed less alcohol than students with one foreign-born parent and one native-born Dutch parent.

### *Ethnic differences: Muslim versus non-Muslim*

The significant difference between Muslim and non-Muslim students observed in this study is in line with earlier findings in Norway (Amundsen *et al.* 2005) and Great Britain (Bradby and Williams 2006). As proscribed by religious doctrines in the Koran, Muslims are strictly prohibited from consuming alcohol (Dotinga 2005),

whereas such strong normative constraints do not apply to other religions. Presumably, children in Muslim groups are socialized by their parents to refrain from (excessive) alcohol consumption (Amundsen *et al.* 2005, Bradby and Williams 2006). This strict norm is internalized by the children and provides an important framework for their behavior later in life. Muslim students who deviate from this strict prohibition on alcohol use may be reprimanded by their parents. The importance of parents in the process of socializing, internalizing, and approving the norm-guided behavior of their children is well established in the literature on substance use (Hundleby and Mercer 1987, Flay *et al.* 1994, Hu *et al.* 1995, Wood *et al.* 2004).

***Percentage of Muslims in school***

Besides the parents, the school setting is another major force that controls and possibly inhibits students' alcohol use. It is well known that peer norms and practices are important determinants of substance use (Urberg *et al.* 1997, Kumar *et al.* 2002, Ellickson *et al.* 2003, Wood *et al.* 2004, Bjarnason *et al.* 2005, Wallace *et al.* 2007). Average alcohol consumption at a school has been found to affect individual students' drinking behavior (Ennett *et al.* 1997, Kumar *et al.* 2002). Because of socialization and peer effects, we expected that the presence of Muslim students in school would be associated with lower levels of alcohol use among both ethnic minority students and native-born Dutch students. The findings clearly confirmed that expectation for the native-born Dutch students. This is in line with the study by Admundsen *et al.* (2005) conducted in Norway, and suggests that native-born students are influenced by strict norms in schools where Muslim students have a greater presence. Monshouwer *et al.* (2007), who used data on the Netherlands, did not observe a negative correlation for native-born Dutch students. It is possible that they did not find a significant association because they relied on the percentage of 'ethnic minorities' in school rather than the presence of Muslim students. The group of 'ethnic minorities' is quite heterogeneous, and includes a fairly large number of students from western countries with relatively high drinking levels.

With respect to ethnic minority students, the present study generally found a significant negative association with the percentage of Muslims in the school: their presence was significantly associated with a reduced likelihood of any alcohol consumption at all in each ethnic group (except Antilleans). This suggests that more conservative norms on alcohol use in which minority students are socialized by their parents are effectively reinforced in predominantly Muslim schools. As expected, the presence of Muslims in school was also associated with lower levels of drunkenness and lower drinking frequency among Surinamese, Antillean, and 'other' ethnic students.

The findings were less clear for the Turkish and Moroccan groups. Of those students who drink at all, there was no significant association between the presence of Muslims in school and alcohol consumption and drunkenness among Turks, and even a significant positive association between their presence and the likelihood of drunkenness among Moroccan students. This suggests that the presence of Muslims in school has a differential effect among Moroccans: it reduces the likelihood that they will consume alcohol at all, but among those Moroccan students who did consume alcohol, it increases the likelihood of drunkenness among them. It should

be noted, however, that this finding was based on a small group of Moroccan students who consumed alcohol. The overwhelming majority of the Moroccans (84%) did not consume alcohol at all and it would be premature to draw conclusions on the small and highly selective group that did. On the other hand, the differential pattern for the Moroccan students may be real and important. The results may indicate that the presence of Muslims in school reduces alcohol use among the majority of Moroccans, while a larger Muslim presence provides a necessary condition for developing a culture among a smaller group of Moroccan youth who oppose their parents' strict norms. More research on the (differential) effects of ethnic-religious composition of schools on alcohol use is needed.

### *Ethnic intermarriage*

In order to examine the importance of ethnicity and norms for alcohol consumption, this study investigated differences between students with mono-ethnic and ethnically mixed parents. Ethnic intermarriage indeed played a role in alcohol consumption. Students with two foreign-born parents consumed less alcohol than students with one foreign-born parent and one native-born Dutch parent. This observation pertained to each measure examined: drinking alcohol at all, drunkenness, and frequency of drinking. One explanation for the higher levels of alcohol use among children with mixed parents is that these children experience more acculturative stress, leading to more personal problems (Gil *et al.* 2000, Hahm *et al.* 2004), in turn leading to higher levels of alcohol use. However, this study found higher levels of alcohol use among children of two native-born Dutch parents than among children of mixed parents. In addition, this study controlled for the number of problems students reported having with their parents and at school. A more plausible explanation is that students of mixed parentage are more exposed to Dutch liberal norms on drinking than students of mono-ethnic parentage, although less so than children with two native-born Dutch parents. Further research could elaborate on these findings, examining the influence of ethnic intermarriage for each ethnic group separately.



## Note

1. This so-called 'intraclass correlation coefficient' $\rho 1$ was computed according to the following formula: $\rho 1 = \frac{(\tau_0^2)}{(\tau_0^2 + \sigma_0^2)}$, where $\tau_0^2$ is the variance at the school level and $\sigma_0^2$ is the variance at the individual level. Note that the logistic distribution for the level-one residual $\sigma_0^2$ implies a variance of $\pi^2/3 \approx 3.29$ (Snijders and Bosker 1999, p. 224).

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